

Impact of COVID-19 on Tunisian Imports

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Motivation (1/3)

► In 2020:

- Imports declined by 19%
- Exports declined by 11%

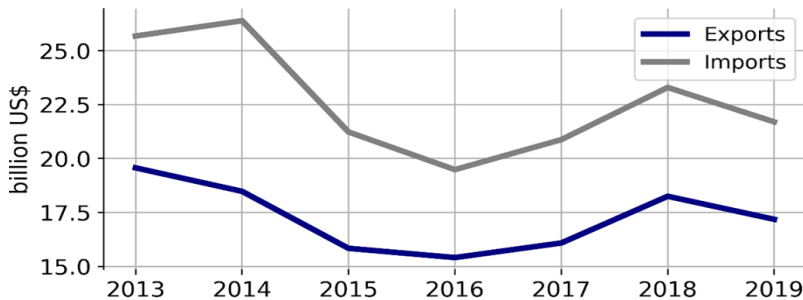


Figure 1: Development of Tunisia's trade flows

Motivation (2/3)

- Sectors participating in backward GVCs heavily impacted

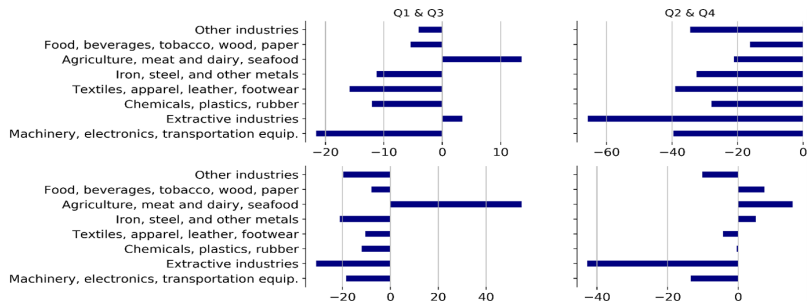


Figure 2: Change in Tunisia's imports 2019-20 by sector (%)

Motivation (3/3)

- Intermediate products more impacted than consumption products

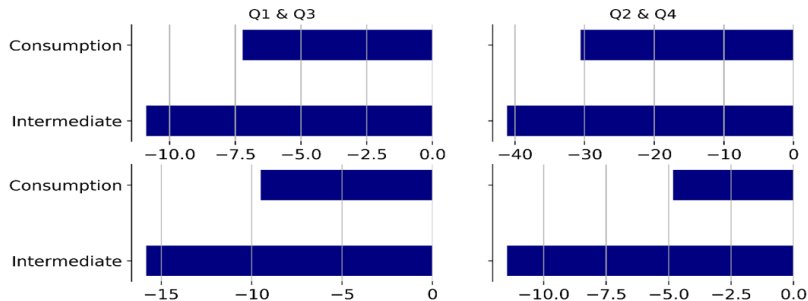


Figure 3: Change in Tunisia's imports 2019-20 by end-use (%)

Research questions

- ▶ What imported products are most vulnerable to supply shocks?
 - ▶ 776 vulnerable products (17% of overall imports in 2019)
 - ▶ Main sectors: extractives, machinery, food
 - ▶ 132 essential products
- ▶ Is Tunisia's import basket highly sensitive to vulnerable imports?
 - ▶ Vulnerable and essential imports have a significant positive impact on overall imports
 - ▶ Impact of essential products outweighs that of vulnerable products
- ▶ How much sensitive are Tunisia's local industries to vulnerable imports?
 - ▶ Negatively affected industries: oil refining, textiles, chemicals

Previous studies (1/3)

- ▶ Tunisia among the top countries most impacted by Chinese supply disruption
 - ▶ Friedt and Zhang (2020)

Previous studies (2/3)

- ▶ Korniyenko et al. (2017)
 - ▶ presence of central players
 - ▶ tendency to cluster
 - ▶ international substitutability

- ▶ Bonneau and Nakaa (2020)
 - ▶ concentration of imports of each product
 - ▶ international substitutability of the product

- ▶ Todo, Nakajima and Matous (2015) & Huang (2019)
 - ▶ diversification of partners results in higher resilience
 - ▶ reliance on a limited number of suppliers exposes a country to the risk of policy changes

Previous studies (3/3)

- ▶ Carvalho et al. (2016)
 - ▶ study the propagation of the shock resulting from the Great East Japan Earthquake of 2011 along the supply chain
- ▶ Acemoglu et al. (2016a)
 - ▶ estimate the indirect effects of upstream and downstream exposure of employment in the US manufacturing and nonmanufacturing industries to imports from China
- ▶ Acemoglu et al. (2016b)
 - ▶ study the propagation of different shocks along the US local industries.

Methodology (1/3): Drivers of vulnerability

- ▶ Market concentration

- ▶ Herfindahl-Hirschman Index (HHI)
- ▶ CEPII - BACI data, average for the period 2013-19
- ▶ Imports dominated by a limited number of countries are the most vulnerable

- Intensity of imports

- ▶ Revealed Comparative Advantage (Import-RCA)
- ▶ CEPII - BACI data, average for the period 2013-19
- ▶ Products imported intensively are more vulnerable to supply shocks

► Essential products

- ▶ List 1: World Bank
- ▶ List 2: World Customs Organization & World Health Organization

Methodology (2/3): First differences model

$$(1) \quad \Delta IMP_{it} = \beta_1 \Delta VIMP_{it} + \beta_2 \Delta MED_COVID19_{it}$$

$$(2) \quad \Delta IMP_{it} = \beta_1 \Delta VIMP_{it} + \beta_2 \Delta MED_COVID19_{it} + \beta_3 (\Delta VIMP_{it} * Num_restrictions_i) + \beta_4 (\Delta MED_COVID19_{it} * Num_restrictions_i)$$

- ▶ Time span: 2019 - 2020, month - quarter data
- ▶ $\Delta VIMP$: the change in vulnerable imports, it includes products that are both concentrated and intensively imported
- ▶ $\Delta MED_COVID19$: the change in imports of essential products
- ▶ Num_restrictions: the number of restrictions imposed by partner countries due to COVID-19, ITC Market Access Map

Methodology (3/3): Tunisia's input-output model

$$(3) \quad Shock_{j,t} = \frac{\text{vulnerable or essential imports}_{j,t}}{\text{value added}_{j,2019} + \text{imports}_{j,2019} - \text{exports}_{j,2019}}$$

$$(4) \quad Downstream_{i,t} = \sum_j (Input_{j \rightarrow i}^{2015} - 1_{j=i}) * \Delta Shock_{j,t}$$

- ▶ IO table: 2015, National Institute of Statistics
- ▶ Import, export and value added vectors: National Institute of Statistics
- ▶ The downstream shock is “the interaction of the vector of shocks hitting other industries and a vector representing the interlinkages between the focal industry and the rest” (Acemoglu et al., 2016b).
- ▶ $Input^0_{j \rightarrow i}^{2015}$: the elements of the Leontief inverse of the IO matrix
- ▶ $1_{j=i}$: an indicator function for $j = i$

Results (1/5): Vulnerability indicators

- ▶ Agriculture: less diversified suppliers
- ▶ Machinery: most diversified suppliers
- ▶ Textiles: highest import intensity
- ▶ Extractives: low diversification of suppliers and high import intensity

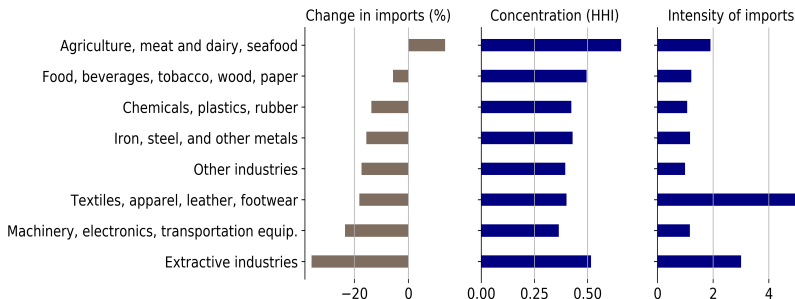


Figure 4: Change in Tunisia's imports vs vulnerability indicators

Results (2/5): Characteristics of vulnerable imports

- ▶ The biggest share of imported vulnerable products is composed of intermediate products
- ▶ Intermediary inputs represented 86% of Tunisia's imports in 2019

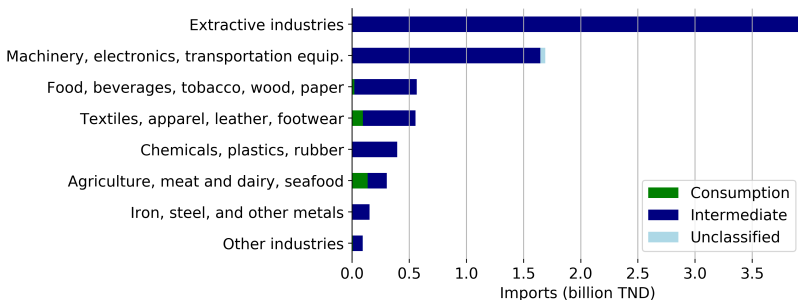


Figure 5: Characteristics of vulnerable imports (2019)

Results (3/5): Top suppliers of vulnerable imports

- ▶ Extractives are mainly imported from Algeria
- ▶ France and Italy main suppliers of vulnerable products

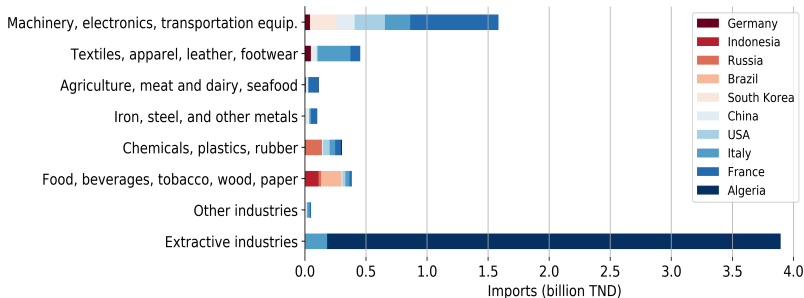


Figure 6: Tunisia's top suppliers of vulnerable products (2019)

Results (4/5): First differences estimations

- ▶ Significant and positive impact of vulnerable and essential imports on overall imports
- ▶ Impact of essential imports is more important
- ▶ Restrictions have a significant impact

	Data by month/country			Data by quarter/country		
	(1)	(2)	(3)	(1)	(2)	(3)
Δ VIMP	1.211*** (0.038)	1.196*** (0.038)	1.010*** (0.060)	1.290*** (0.065)	1.268*** (0.064)	0.819*** (0.105)
Δ MED_COVID19	4.712*** (0.174)	4.606*** (0.172)	6.729*** (0.349)	5.733*** (0.281)	5.579*** (0.278)	8.432*** (0.618)
Num_restrictions		-0.002*** (0.000)	-0.002*** (0.000)		-0.005*** (0.001)	-0.006*** (0.001)
Δ VIMP:Num_restrictions			0.133*** (0.037)			0.329*** (0.067)
Δ MED_COVID19:Num_restrictions			-0.671*** (0.094)			-0.996*** (0.180)
R-squared	0.528	0.540	0.557	0.585	0.599	0.632
R-squared Adj.	0.528	0.540	0.556	0.584	0.598	0.629
No. Observations	1708	1708	1708	674	674	674

* $p < .1$, ** $p < .05$, *** $p < .01$

Results (5/5): Tunisian industries' exposure to COVID-19 supply shock

- ▶ Direct shock more significant
- ▶ Oil refining, textiles, and chemicals negatively affected

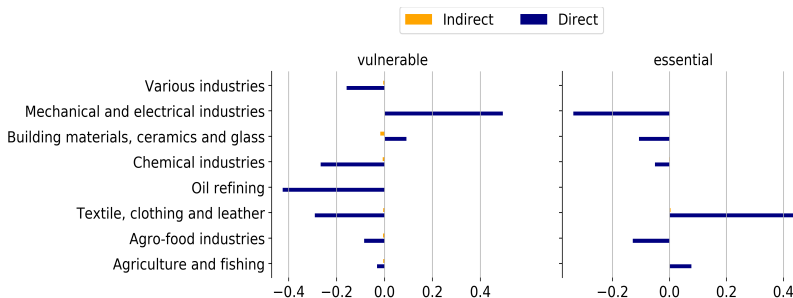


Figure 7: Impact on Tunisian industries - direct and indirect impacts

Summary

- ▶ Vulnerable products based on three metrics: partners concentration, import intensity and product's nature
- ▶ Intermediate products are the most vulnerable
- ▶ Top sectors with vulnerable imports: Extractives, Machinery, Food
- ▶ Indirect exposure to supply shocks is far less pronounced than direct exposure
- ▶ Top industries negatively impacted by COVID-19 supply shock: Oil refining, Textiles, Chemicals

Discussion (1/2)

- ▶ Other factors could explain the drop in imports such as demand not considered

Discussion (2/2)

- ▶ National
 - ▶ warehousing
 - ▶ diversifying sources of inputs
- ▶ Bilateral & Regional
 - ▶ supply chain sectors
 - ▶ alleviation of NTBs
 - ▶ more standard harmonization

Thank you for your attention!

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